DAIRY SAVES TIME AND MONEY AT THE RECEIVING BAY WITH MICRO MOTION

Application

Regardless of the product being made at a dairy plant, the first step in the process is receiving raw milk from the farms. Historically, dairy plants have relied on truck scales to weigh the tanker before and after unloading, using the loss in weight as the means of determining the quantity of milk delivered. The quality of the milk received, judged on the basis of milk fat percent, is sampled throughout the unloading process to determine the price paid for the milk.

Challenge

One of the challenges of receiving milk is the fluid dynamics of the process itself. A hose is attached to the bottom of the tanker and milk is then pumped out. At the beginning and the end of the process, when the tanker is emptying, significant amounts of entrained air and milk foam fill the line. This creates a problem for volumetric meters which require a “full pipe” in order to meter accurately. Foam and air flowing through volumetric meters register false volumes and will overstate the actual quantity unloaded from the tanker.

Another significant challenge involves the logistics of weighing each tanker before and after unloading. This process is time-consuming and slows down throughput at the receiving bay. At many large dairies, it is not uncommon to see tankers lined up for hours, waiting to unload their perishable product.

Results

- Saved over $100,000 per year from improved accuracy, throughput and reduced maintenance
- Accurate monitoring of percent milk fat by tanker load
- Eliminated measurement errors caused by foaming and entrained air

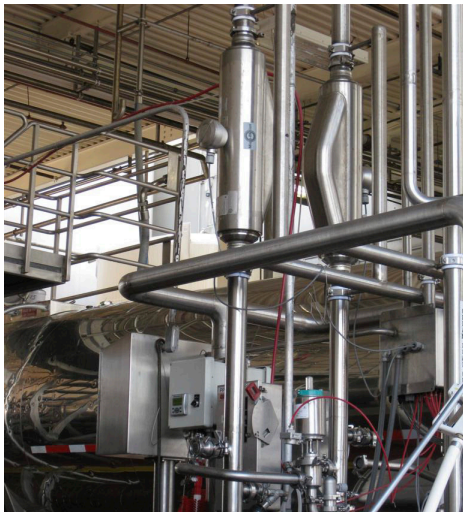

Figure 1. *Two-truck receiving bay using Micro Motion H300 flowmeters for direct mass measurement of delivered milk.*

EMERSON™

DAIRY SAVES TIME AND MONEY AT THE RECEIVING BAY WITH MICRO MOTION

Solution

A large dairy in Idaho selected the Micro Motion® H-Series Coriolis mass flow and density meter for this hygienic, 3A-rated application. A three-inch meter was selected based on the operating flow rates of both milk and the cleaning fluids used during clean-in-place (CIP).

The meter, with an accuracy of ±0.1%, was installed downstream of an inline air eliminator. Due to the need for a local operator interface and the desire to monitor total average density of each tanker load, the Model 3700 transmitter was paired with the sensor. The transmitter was programmed to monitor and record the average milk density and temperature of each tanker load. Average density and temperature outputs were fed into a PLC which calculated average milk fat concentration for the load. The user interface allowed for simple operator resets between loads. In addition, the transmitter was connected directly to a printer that provided critical load information (mass and gallon quantity, average milk fat percentage and average temperature) on a ticket to support tanker receiving documentation.

The dairy estimated it saved over $100,000 per year from the following:

- Improved accuracy on milk receipts and billing
- Improved throughput and reduced labor cost at loading bays
- Reduced maintenance with the elimination of the truck scale
- Improved monitoring of milk fat over the entire load

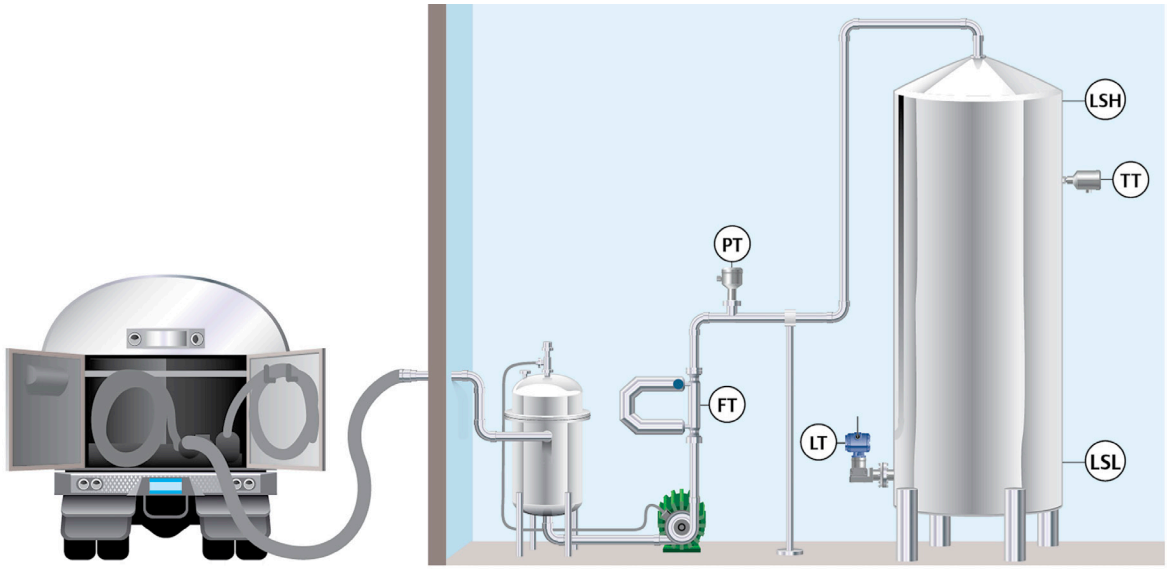

Figure 2. *Raw milk received from dairy farms must be monitored for quantity received, fat content and temperature during offloading to raw milk storage vessels.*

For more information,visit
Emerson.com/MicroMotion

AN-001234 Rev C

MICRO MOTION

EMERSON